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LIQUID CLEANING AGENT OR DETERGENT COMPOSITION

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Abstract

A liquid cleaning agent or detergent composition that is separated into at least two aqueous phases in a state of rest, containing at least one surfactant in a concentration of less than 10 wt. % and at least one electrolyte in a concentration of less than 15 % under the proviso that the composition contains less than 10 wt. % organic solvent and less than 6 wt. % sodium hexametaphosphate if at all.

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This invention concerns a liquid cleaning agent or detergent composition.

Both in the cleaning of hard surfaces, in particular in the kitchen or bathroom, as well as in the washing of soiled fabrics, there often is the problem that both inorganic and organic soils must be removed. While surfactants are usually used to remove most organic soils, they are normally less effective against inorganic soils and often are even entirely without effect.

For this reason, to remove inorganic soils it is necessary to use compounds that are suitable for lifting or dissolving the soils, mostly in an aqueous solution. According to the type of soil these compounds can be acid, neutral or alkaline compounds.

Acid aqueous solutions are preferably used to dissolve calcium deposits, which are usually due to hardness elements in the water. To remove other inorganic, for example, clay-containing and/or pigment-containing, soils, aqueous solutions with ingredients that have a pH in the neutral or alkaline region in aqueous solution are more suitable.

In both cases, however, it has been found that the addition of surfactants to aqueous solutions that are intended to remove inorganic soils, in order to be able to use them to get rid of organic soils as well, can lead to a distinct reduction of their performance with respect to inorganic soils.

The invention is based on the task of developing a liquid cleaning agent or detergent composition that, in spite of containing a surfactant, also exhibits good cleaning action toward inorganic soils.

In accordance with the invention, this task is solved by a liquid cleaning agent or detergent composition that in a state of rest separates into at least two aqueous phases, with a content of at least one surfactant in a concentration of less than 10 wt% and a content of at least one electrolyte in a concentration of less than 15 wt%, with the stipulation that the composition contains less than 10 wt% organic solvent and less than 6 wt% sodium hexametaphosphate, if it contains these substances at all.

In a preferred embodiment of the invention the surfactant(s) is (are) present in a concentration from 0.5 to 6 wt%.

Preferably, it is provided that the electrolyte(s) is (are) present in a concentration of at least 0.5 wt%.

An alternative form of the invention is characterized by the fact that the electrolyte includes at least one acid and the surfactant includes at least in some cases at least one surfactant that has a net positive charge at the pH value of the composition.

In a preferred embodiment of this alternative of the composition in accordance with the invention the concentration of acid is 0.5-15 wt%.

In another preferred embodiment of this alternative of the composition in accordance with the invention the concentration of acid is 7-10 wt%.

Especially preferably, it is provided that the pH of the composition is under 4.

The acid(s) that are preferably provided for use with this alternative of the composition in accordance with the invention is (are) chosen from the group that consists of phosphoric acid, amidosulfonic acid and mixtures of these acids.

This invention concerns a liquid cleaning agent or detergent composition.

The preferred surfactant(s) is (are) chosen from the group that [consists] of quaternary ammonium salts, amines, amine oxides, betaines, sulfobetaines and mixtures of these compounds.

In a second alternative form of the composition in accordance with the invention it contains preferably at least one builder or a builder system, at least one alkali or alkalinizing compound or mixtures of these compounds.

Preferably, the builder(s) or builder system or the alkaline or alkalinizing compound(s) is (are) present in a concentration of 0.5-6 wt%.

It is especially preferably that the surfactant includes at least in part at least one cationic surfactant.

The composition in accordance with the invention has in a preferred embodiment a content of at least one other compound that promotes phase separation.

In one alternative this can be a compound that promotes phase separation by salting out, and here an alkali metal, alkaline earth metal or ammonium salt of an inorganic acid, preferably sodium chloride, in particular is a possibility.

In another alternative the compound that promotes phase separation is chosen to be one that has at least one hydrophobic part and one anionic group. Preferably this can be an anionic surfactant, xylene- or cumenesulfonic acid or their salts or mixtures of these compounds.

The composition in accordance with the invention in a preferred embodiment is characterized by a content of at least one fragrance and/or one colorant.

In addition, the invention concerns the use of a composition that is present in a state of rest in at least two separate aqueous phases and has a content of at least one surfactant, as cleaning agent or laundry detergent.

Here preferably one of the said compositions in accordance with the invention is used.

An especially preferred embodiment concerns the use of such a composition with a content of at least one acid for removal of calcium deposits, where here, too, the corresponding compositions indicated above are preferably used.

Another embodiment of the composition in accordance with the invention concerns the use of at least one electrolyte in a liquid cleaning agent and laundry detergent composition containing at least one surfactant to promote the separation of the composition into at least two aqueous phases in order to improve the cleaning or washing power of the composition.

Finally, the invention also concerns the use of xylene- or cumenesulfonic acid or their salts in a liquid cleaning agent and laundry detergent composition that contains at least one surfactant and at least one acid for promoting the separation of the composition into at least two aqueous phases in order to improve the removal of calcium deposits.

Surprisingly, it turned out that the formulation of a cleaning agent or laundry detergent in the form of a composition that is present in separate form in at least two aqueous phases in a state of rest leads to an unexpected improvement of the cleaning power of such compositions, in particular the dual action both against organic and inorganic soils is ensured. If such a composition is shaken or thoroughly mixed before or during use, a dispersion results that enables homogeneous application to the surface or substrate. In a state of rest, this dispersion separates relatively quickly to form separate aqueous phases, both on the surface or the substrate as well as in the supply container.

Without wishing to be committed to this theory, it is assumed that this separation on the surface to be cleaned or substrate to be cleaned is at least one of the principles for the superior cleaning action that has been established, since the negative mutual influence of the compounds used for the different cleaning purposes is at least reduced, in particular the negative effect of the surfactant or surfactants on the cleaning action of the aqueous solutions toward inorganic soils.

Cleaning agent or detergent compositions with two or more aqueous phases have not been known up to now. Up to now, such compositions have only been described for cosmetics and body care agents (for example, shampoos).

For instance, a liquid composition for use as a shampoo or the like, which contains a surfactant, a water-miscible organic solvent and an electrolyte, where the relative amounts of electrolyte and organic solvent are such that the composition separates into two aqueous phases, is known from GB-A-1 247 189. When shaken, such compounds form a temporary oil-in-water emulsion and separate back into two phases upon standing. The compositions require a significant content of an organic solvent and/or electrolyte.

Shampoo compositions that also separate into two aqueous phases in a state of rest are known from EP 0 116 422 A1 and 0 175 485 A2. In the case of EP 0 116 422 A1 it is in any case compulsory for there to be a content of at least 6 wt% sodium hexametaphosphate, in addition to surfactant. In the case of EP 0 175 485 A2 the minimum content of surfactant in the composition

is 11 wt%. Moreover, the desired purpose of phase separation is only achieved by using particular complexing agents such as organophosphonates, aminocarboxylic acids, etc.

Surprisingly, it turned out that it is possible to obtain a liquid cleaning agent or laundry detergent composition that separates into at least two aqueous phases in a state of rest, with a relatively low content of surfactant and electrolyte, without it being necessary to use additional substances to achieve this goal.

Analyses of the two phases of the composition in accordance with the invention that normally arise showed that the upper phase contains the surfactant(s), fragrance(s) and optionally dye(s), while the other ingredients, in particular the electrolyte, are essentially uniformly distributed in the two phases.

It seems particularly notable that it is readily possible to adjust the composition so that the volume of the two phases is nearly identical. If the volume of the two phases is unevenly divided, the addition of a small amount of a nonionic surfactant can help to establish the desired equal volume of the two phases in some cases.

Besides achieving the desired phase separation and a surprisingly low content of surfactant and electrolyte and superior cleaning and washing power, another surprising advantage, as cited above, is that a fragrance that may be added becomes concentrated nearly exclusively in the upper phase. This is advantageous on the one hand because the importance of the addition of a fragrance to such a composition is to mask other undesirable odors and therefore the desired "cover up effect" can optimally be achieved in the upper phase. For another thing, by concentrating the fragrance in the upper phase in a preferred case, i.e., when the phases are about equal in volume, it is possible to reduce the content of fragrance in the overall composition to about half, which means a significant cost savings, especially with expensive fragrances.

With the acid compositions in accordance with the invention, in addition to the quaternary ammonium salts, amines, amine oxides, betaines and sulfobetaines claimed above, it goes without saying that all other surfactants that have a net positive charge at the pH value of the composition are also suitable.

Also, the acids that are preferably indicated for removal of calcium deposits, i.e., phosphoric acid and amidosulfonic acid, do not, of course, represent the only possible choice. Other possible acids include, for example, citric acid, maleic acid, succinic acid, glutaric acid, adipic acid, hydrochloric acid, etc.

Besides the specifically claimed builders or builder substances or alkaline or alkalinizing compounds, other compounds or mixtures that have a corresponding cleaning action toward inorganic soils are of course also suitable for this invention.

Cationic surfactants, such as those mentioned above, can optionally be used in the neutral or alkaline compositions in accordance with this invention.

Of course, the compounds that are used to promote phase separation are also not restricted to the salts or organic compounds specifically mentioned above.

As already noted, in individual cases the addition of an (usually small) amount of nonionic surfactant can help to establish an approximately equal volume of the two aqueous phases. In general, there are no particular restrictions on the kind of nonionic surfactant that is used. All of the known nonionic surfactants are suitable here, in particular fatty alcohol ethoxylates and alkyl phenol ethoxylates.

The choice and amount of suitable fragrances and colorants is essentially determined from the standpoint of aesthetics and the stability of these compounds in the compositions in accordance with the invention and does not present any particular difficulties to the specialist in this field.

Other advantages and characteristics of the invention ensue from the following examples:

Examples I-V

Various compositions in accordance with the invention, with delayed redeposition of soil, and containing an acid can be seen from the following Table 1.

Table 1

Gew.-% (1) / Komponente (3)	Beispiel I	Beispiel II	Beispiel III	Beispiel IV	Beispiel V (2)
(4) Amidosulfonsäure	5	5	5	5	5
(5) Phosphorsäure	3,75	3,75	3,75	3,75	3,75
(6) Alkyl(C_{16})-trimethylammoniumchlorid	2,5	1,5	-	-	-
(7) Oleyl-bis-(2-hydroxyethyl)-methylammoniumchlorid	-	-	1,9	-	-
(8) Oleyl-bis-(2-hydroxyethyl)-amin	-	-	-	3	-
(9) Lauryldimethylaminoxid	-	-	-	-	1,8
(10) Natriumcumolsulfonat	1,42	0,8	0,65	0,8	0,63
(11) Natriumchlorid	-	-	-	0,5	-
(12) Duftstoff	0,15	0,15	0,15	0,15	0,15
(13) Farbstoff (Acid Blue 80)	-	0,0015	0,0015	0,0015	0,0015
(14) Wasser	-	(15) Rest	Rest	Rest	Rest

Key:
1 wt%
2 Example ___
3 Component
4 Amidosulfonic acid
5 Phosphoric acid
6 Alkyl (C_{16}) trimethylammonium chloride
7 Oleylbis(2-hydroxyethyl)methylammonium chloride
8 Oleylbis(2-hydroxyethyl)amine
9 Lauryldimethylamine oxide
10 Sodium cumenesulfonate
11 Sodium chloride
12 Fragrance
13 Dye (Acid Blue 80)
14 Water
15 Remainder

Although this does not appear to be crucial for the product, the following sequence of adding the components to water in order to produce the compositions in accordance with the invention is clearly advantageous:

1. Water
2. Electrolytes (acid(s), sodium chloride)
3. Surfactant(s), fragrance(s), dye(s)
4. Sodium cumenesulfonate

In all cases there was a clear separation of the composition into two aqueous phases roughly equal in volume in a state of rest, and it turned out from analysis of the individual phases that the surfactant, dye and fragrance were nearly exclusively contained in the upper phase, while the acids and the sodium cumenesulfonate that acts as hydrotrope were distributed approximately equally in the two phases.

The calcium deposit cleaning action of the compositions in accordance with the invention was investigated on a test model. In each case a single phase composition that essentially had the same composition as the compositions in accordance with Examples I, II or IV, but where the sodium cumenesulfonate had been replaced by water, was used in each case as the comparison example.

To determine the calcium dissolving behavior of these compositions a marble cube in a metal sieve was completely immersed into the corresponding solution for a period of 30 min and the weight loss of the marble cube in percent was determined after 1, 2, 5, 10 and 30 min.

In each case the two-phase formulation homogenized beforehand by shaking was tested against the single-phase comparison formulation that was identical in acid and surfactant content. For the two-phase formulation care was taken that phase separation, which as a rule began after a few minutes, was prevented above and below by briefly agitating the sieve, which was filled to about half its height.

The test variation was chosen because it does a good job of reflecting the actual conditions of use for the corresponding cleaning agents.

Results

Table 2

Kalklösevermögen in % als Funktion der Zeit: (1)	1 min	2 min	5 min	10 min	30 min
I	0,41	0,78	1,73	3,37	9,97
I′ (Vergleichsbeispiel) (2)	0,41	0,72	1,93	3,07	8,37
II	0,51	0,98	2,27	4,40	11,08
II′ (Vergleichsbeispiel) (2)	0,44	0,79	1,72	3,21	8,93
IV	0,47	0,80	1,73	3,23	9,39
IV′ (Vergleichsbeispiel) (2)	0,22	0,41	0,93	1,80	5,56

Key: 1 Calcium dissolving time in % as a function of time
2 (Comparative example)

The results given above show that the shaken two-phase formulation is clearly superior to the corresponding single-phase formulation in its calcium dissolving capacity.

The same positive results were achieved when the sodium cumenesulfonate was replaced by the corresponding amounts of sodium xylenesulfonate.

Example VI

Another acid cleaning composition in accordance with the invention results from the following Table 3.

Table 3

Gew.-% ① / Komponente ③	Beispiel VI ②
Alkylbenzolsulfonat ④	3
Phosphorsäure ⑤	3,7
Amidosulfonsäure ⑥	5
Alkylethoxylat-C9, 11-12EO ⑦	1
Duftstoff ⑧	0,15
Farbstoff (Acid Blue 80) ⑨	0,0015
Wasser ⑩	Rest ⑪

Key:
1 wt%
2 Example VI
3 Component
4 Alkylbenzene sulfonate
5 Phosphoric acid
6 Amidosulfonic acid
7 Alkyl ethoxylate-C9, 11-12 EO
8 Fragrance
9 Dye (Acid Blue 80)
10 Water
11 Remainder

In this composition alkylbenzene sulfonate was used as anionic surfactant instead of a salt of cumene- or xylenesulfonic acid. Conducting the calcium dissolving tests described for the previous examples likewise show superior performance compared to a corresponding single-phase formulation, but the effect does not turn out to be as distinct as with the use of sodium cumenesulfonate or sodium xylenesulfonate.

Examples VII-XV

Various neutral or alkaline disinfection cleaner compositions in accordance with this invention result from the following Table 4.

Table 4

Gew.-% / Komponente	Beispiel VII	Beispiel VIII	Beispiel IX	Beispiel X
Natriumcarbonat	0,75	0,75	-	-
Natriumchlorid	-	-	-	-
Natriumsulfat	0,75	2	2	
Natriumtripoly-phosphat	-	1,5	-	-
Kaliumtripoly-phosphat	-	-	-	-
Phosphonat	-	-	-	-
EDTA	-	-	-	-
HEDP	-	-	-	-
Disilikat	-	-	-	3
Metasilikat	-	-	2	-
Didecyldime-thylammonium-chlorid[1]	2,8	2,8	2,8	2,8
C_{12-16}-Benzyldimethyl-ammoniumchlo-rid[2]	-	-	-	-

Nicht-ionisches Tensid (FAO, C9-11,6-EO) (14)	0,75	-	2	2
Nicht-ionisches Tensid (FAO, (15) C9-11, 2,5-EO)	4	-	-	-
Amphoteres Tensid (16)	-	-	0,9	0,9
Esterquat (17)	1	-	-	-
Dimethyloleyl-amin (18)	1,25	-	-	-
Fettalkohol C_7-C_9 (19)	-	-	-	-
Cocoamidopropylbetain (20)	-	2,7	-	-
C_{12-14}-Glucamid, 50 % (21)	-	-	-	-
Propylenglykol-methylether (22)	-	-	-	-
Duftstoff (23)	0,2	0,2	0,2	0,2
Farbstoff (Acid Blue 80) (24)	0,0015	0,0015	0,0015	0,0015
Wasser (25)	(26) Rest	Rest	Rest	Rest

Gew.-% (1) / Komponente (3)	Beispiel XI (2)	Beispiel XII	Beispiel XIII	Beispiel XIV	Beispiel XV
Natriumcarbonat (4)	0,5	0,75	0,75	0,75	0,75
Natriumchlorid (5)	0,8	-	-	-	-
Natriumsulfat (6)	-	2	3	2	0,5
Natriumtripoly-phosphat (7)	4	1,5	-	-	-
Kaliumtripoly-phosphat (8)	4	-	-	-	3
Phosphonat (9)	0,1	-	-	-	-
EDTA	-	-	-	0,8	-
HEDP	-	-	1,2	-	-
Disilikat (10)	-	-	-	-	-
Metasilikat (11)	-	-	-	-	-
Didecyldime-thylammonium-chlorid[2] (12)	-	-	2,8	2,8	2,8
(C_{12-16}-Ben-zyldimethyl-ammonium-chlorid)[2] (13)	0,4	-	-	-	-
Nicht-ionisches Tensid (FAO, C9-11,6-EO) (14)	-	0,5	2	2	0,75
Nicht-ionisches Tensid (FAO, (15)	-	-	-	-	-

C9-11, 2,5-EO)					
Amphoteres Tensid (16)	3	2,55	0,9	0,9	0,9
Esterquat (17)	-	-	0,5	-	-
Dimethyloleyl-amin (18)	-	-	-	-	1,5
Fettalkohol C_7-C_9 (19)	-	2	2	2	-
Cocoamidopro-pylbetain (20)	-	-	-	-	-
C_{12-14}-Glucamid, 50 % (21)	3	-	-	-	-
Propylengly-kolmethylether (22)	3	-	-	-	-
Duftstoff (23)	0,2	0,2	0,2	0,2	0,2
Farbstoff (24) (Acid Blue 80)	0,0015	0,0015	0,0015	0,0015	0,0015
Wasser (25)	Rest (26)	Rest	Rest	Rest	Rest

(27) [1] ca. 70 %-ige Lösung in Isopropanol

[2] ca. 50 %-ige Lösung in Isopropanol

Key:
1 wt%
2 Example __
3 Component
4 Sodium carbonate
5 Sodium chloride
6 Sodium sulfate
7 Sodium tripolyphosphate
8 Potassium tropolyphosphate
9 Phosphonate
10 Disilicate
11 Metasilicate
12 Didecyldimethylammonium chloride[1]
13 C_{12-16} benzyldimethylammonium chloride[2]

14 Nonionic surfactant (FAO, C9-11.6 EO)
15 Nonionic surfactant (FAO, C9-11, 2.5 EO)
16 Amphoteric surfactant
17 Ester quat
18 Dimethyloleylamine
19 C_7-C_9 fatty alcohol
20 Cocoamidopropylbetaine
21 C_{12-14} glucamide, 50%
22 Propylene glycol methyl ether
23 Fragrance
24 Dye (Acid Blue 80)
25 Water
26 Remainder
27 [1] about 70% solution in isopropanol
[2] about 50% solution in isopropanol

In all cases there was clear separation of the composition into two aqueous phases roughly equal in volume in a state of rest, and analyses of the individual phases showed that the surfactant, dye and fragrance were contained nearly exclusively in one phase, while the other components, especially the builder and the alkaline compound were distributed approximately uniformly in the two phases.

The cleaning effect of the compositions in accordance with the invention was investigated on a test model. The test setup was as follows:

The following ingredients were mixed in a given sequence and stirred for 2 h:

15% clay, passed through a 250 µm screen

10% Myritol® 318 (capryl/capric glyceride, Henkel)

10% cornstarch

15% $CaCO_3$

10% $FeCl_2$

40% tap water.

Before use the mixture was thoroughly shaken one more time in order to produce a homogeneous solution. This standard soil ("pigment/grease-dirt") was applied in a thickness of 100 µm to enamel strips (10 x 40 cm) using a suitable coating device. The strips were stored for at least three days at room temperature in order to achieve a uniform drying process.

The cleaning tests were carried out using an automatic wiping machine (Erichsen). 2 mL of the composition in accordance with the invention was applied to a wet sponge. The number of wiping cycles was 20.

The cleaned strips were visually evaluated. If the lower phase, which essentially did not contain any surfactant, was taken as the reference phase, then a clearly superior cleaning action

is seen for the upper phase that contains the surfactant, and a clearly superior cleaning action is seen for the shaken mixture.

Table 5

Cleaning power (10 = 100% clean; 1 = no cleaning action)

Beispiele ①	XII	XIII	XIV	XV
Geschüttelte Mischung ②	8	9	9	8
Untere Phase ③	6	7	8	6
Obere Phase ④	3	2	6	3

Key: 1 Examples
2 Shaken mixture
3 Lower phase
4 Upper phase

The characteristics of the invention disclosed in this invention and in the claims can be important both individually and in any combination for the realization of the invention in its various embodiments.

Claims

1. A liquid cleaning agent or detergent composition, which separates into at least two aqueous phases in a state of rest, containing at least one surfactant in a concentration of less than 10 wt% and at least one electrolyte in a concentration of less than 15 wt%, with the stipulation that the composition contains, if at all, less than 10 wt% organic solvent and less than 6 wt% sodium hexametaphosphate.

2. A composition as in Claim 1, which is characterized by the fact that the surfactant(s) is (are) present in a concentration from 0.5 to 6 wt%.

3. A composition as in Claim 1 or 2, which is characterized by the fact that the electrolyte(s) is (are) present in a concentration of at least 0.5 wt%.

4. A composition as in one of Claims 1-3, which is characterized by the fact that the electrolyte contains at least one acid and the surfactant contains at least in part at least one surfactant, which at the pH of the composition has a net positive charge.

5. A composition as in Claim 4, which is characterized by the fact that the concentration of acid is 0.5-15 wt%.

6. A composition as in Claim 5, which is characterized by the fact that the concentration of acid is 7-10 wt%.

7. A composition as in one of Claims 4-6, which is characterized by the fact that the pH of the composition is less than 4.

8. A composition as in one of Claims 4-7, which is characterized by the fact that the acid(s) is (are) chosen from the group that consists of phosphoric acid, amidosulfonic acid and mixtures of these acids.

9. A composition as in one of Claims 4-8, which is characterized by the fact that the surfactant(s) is (are) chosen from the group that consists of quaternary ammonium salts, amines, amine oxides, betaines, sulfobetaines and mixtures of these compounds.

10. A composition as in one of Claims 1-3, which is characterized by the fact that the composition contains at least one builder or builder system, at least one alkaline or alkalinizing compound or mixtures of these.

11. A composition as in Claim 10, which is characterized by the fact that the builder(s) or builder system or the alkaline or alkalinizing compound(s) is (are) present in a concentration from 0.5 to 6 wt%.

12. A composition as in Claim 10 or 11, which is characterized by the fact that the surfactant contains at least in part at least one cationic surfactant.

13. A composition as in one of the preceding claims characterized by a content of at least one other compound that promotes phase separation.

14. A composition as in Claim 13, which is characterized by the fact that the compound promotes phase separation through salting out.

15. A composition as in Claim 14, which is characterized by the fact that the compound is an alkali metal, alkaline earth metal or ammonium salt of an inorganic acid.

16. A composition as in Claim 15, which is characterized by the fact that the compound is sodium chloride.

17. A composition as in Claim 13, which is characterized by the fact that the compound has at least one hydrophobic part and at least one anionic group.

18. A composition as in Claim 17, which is characterized by the fact that the compound is an anionic surfactant, xylene- or cumenesulfonic acid or their salts or mixtures of these substances.

19. A composition as in one of the preceding claims, characterized by a content of at least one fragrance.

20. A composition as in one of the preceding claims, characterized by a content of at least one dye.

21. The use of a composition that separates into at least two aqueous phases in a state of rest and has a content of at least one surfactant, as cleaning agent or laundry detergent.

22. A use as in Claim 21, which is characterized by the fact that a composition as in one of Claims 1-20 is used.

23. The use as in Claim 21 of a composition containing at least one acid to remove calcium deposits.

24. A use as in Claim 23, characterized by the fact that a composition as in one of Claims 4-9 or 13-20, insofar as they refer back to Claims 4-9, is used.

25. A use of at least one electrolyte in a liquid cleaning agent and laundry detergent composition containing at least one surfactant to promote the separation of the composition into at least two aqueous phases to improve the cleaning or washing power of the composition.

26. A use of xylene- and/or cumenesulfonic acid or their salts in a liquid cleaning agent and laundry detergent composition containing at least one surfactant and at least one acid to promote the separation of the composition into at least two aqueous phases to improve the performance in the removal of calcium deposits.